RELEASE NOTES

Geophysics

Powerful seismic interpretation for your play

Release Notes

GVERSE Geophysics 2019.3

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Contents

Introduction

LMKR is pleased to announce the release of GVERSE® Geophysics 2019.3.

This document provides an introduction to the Geophysics software features and benefits. It also lists the changes available in this release.

What is GVERSE Geophysics?

GVERSE Geophysics is a new, intuitive and easy-to-use seismic interpretation system with powerful 3D visualization and interpretation capabilities. GVERSE Geophysics enables geoscientists to execute end-to-end workflows for basic interpretation and more advanced geophysical tasks. The Geophysics software is part of the GVERSE application suite by LMKR (http://www.lmkr.com/gverse).

LMKR GVERSE consists of geoscience and engineering solutions focused on workflow optimization and enhancing productivity of teams working on diverse geological and geophysical projects.

Main Features

In-Depth Horizon Interpretation

Access multiple picking modes to mark picks & track horizons across multiple 2D and 3D surveys.

- QC features like confidence, pick order, pick type & pick relationships.
- Multi-Z horizon picking for 2D data.
- Snapping, smoothing, merging, dip & azimuth calculations and other operations.

Rapid Fault Picking & Analysis

Detect automatically or pick manually with flexible tools for vertical, horizontal & 3D displays.

- Rose diagrams for faster analysis & decisions.
- Correlation windows & fault projection to assist picking in noisy data.
- Fault polygons & heave calculations.

Geobody Analysis

Pick structures on volumes. Interpolate seeds or track signatures to extract geobodies from seismic.

- Calculate volumetrics, map thicknesses, convert to horizons, compute attributes.
- Drape data on geobodies or show intersections on sections.
- Create layers to bring geobodies to other GeoGraphix apps.

Integrated Well Top Picking

- Add new or adjust existing picks for formation tops and fault cuts in a well directly from GVERSE Geophysics.
- View and interact with multiple observations for each formation or fault in a well.

Comprehensive Synthetic Modeling

Simplified synthetic workflows in SynView – an integrated editor with no extra license required.

- Adjust and update synthetic with undo-redo in SynView or in 3D.
- Create and edit wavelets or extract from seismic.
- Calibrate, estimate, process and edit input curves.
- Drift, correlation and spectrum analyses. Calculate optimum time and phase shifts.
- Work with deviated wells.

Robust, Reliable Depth Conversion

Experience fast & reliable depth conversion with options suitable for all conversion requirements.

- Half-a-dozen types of velocity models including ability to use velocity cubes as models.
- Unique 3 component horizons & comprehensive conversion options.
- Dynamic depth conversion to keep backdrops in GVERSE Geomodeling up to date.
- Depth Mode to instantly convert time scenes to depth.
- Variety of velocity QC tools.

Effortless Data Management

Perform rapid interpretation in large 2D, 3D or combination projects with our 64-bit architecture. Versatile SEG-Y readers built to handle most commonly encountered scenarios.

Interactive Mistie Analysis

Easily balance 2D, 3D and 2D-3D datasets and auto-calculate phase, gain & time relationships.

- Add, edit and search shifts in a single location.
- Import and export shift values.
- Interactive line balancing to match lines quickly & easily.

Blazing Fast 3D Environment

Use an engine built for subsurface data to view your seismic, wells and other data in 3D. The LOD format does not compromise performance even with very large seismic files. Voxels, blending, selective transparency and other advanced features let you visualize structures for deeper insights and better decisions for your play.

Versatile Seismic and Well Displays

Feature rich vertical, horizontal & three-dimensional seismic viewers with detailed well data posting.

- Load data into RAM for faster visualization.
- Wiggles, power spectrums, phase rotation, filters & other processing tools.
- Default color palettes based on data type.
- Display wellbores, tops and observations, well logs, production and microseismic data.

Attribute & Surface Calculations

Compute attributes with multiple options in an easy to use interface.

- Flexible windowing options.
- Integration with Zone Manager.
- Surface-to-surface calculations.
- Extract seismic data at well locations.

Crossplot Seismic, Attributes & Logs

Create scatter plots for seismic, surfaces and well logs for insight into relationships between data.

- Crossplots for sections, horizons, wells or volumes.
- Select and display anomalies on maps & 3D.
- Complete annotation toolset.

Intelligent Facies Classification

Use the power of machine learning and neural networks to classify facies on horizons with automatic waveform classification by a self-organizing maps algorithm.

Indigenous Mapping Capability

Fulfill most of your mapping needs with a built-in mapping framework or leverage the full capabilities of our mapping tools with seamless integration with GeoAtlas.

- Multiple base maps with unique set of display parameters and color palettes.
- Comprehensive gridding and contouring options for maps and surfaces.
- Export or import layers to and from other GeoGraphix apps.

Ease of Use & True Mobility

Leverage the latest in technology to minimize your learning curve and focus on what's important. No more digging through tons of menus and dialogs to find what you are looking for. A true multi-screen, ribbon-based interface puts everything you need right in front of you. GVERSE Geophysics supports remote, desktop and mobile environments to accommodate some of the industry's largest regional projects while reducing the need for IT support.

Benefits

Faster, More Informed Decisions: Sharing of geological and geophysical interpretations and data ensures a more efficient asset team. Resulting decisions are faster and more informed – qualities essential to today's fast-paced E&P environment.

Blazing Fast 3D Visualization: GVERSE Geophysics features a 3D viewer that is built on an engine designed and optimized for seismic and related data. It's never been easier to view your seismic sections, horizons, faults, wells and wellbore data, and much more in the 3D space. The new LOD format does not compromise performance even with very large seismic files. With features such as voxel rendering and co-blending, you can visualize subsurface structures like never before, gain more insight into your data, and make better decisions for your play.

Robust & Reliable Depth Conversion: GVERSE Geophysics provides a versatile suite of depth conversion tools to convert your time data to the depth domain. Fast and reliable, our cutting-edge depth conversion algorithms provide an extensive set of options to tackle multiple scenarios. Full integration between our geophysics and geology tools lets you utilize all available data when making key decisions for exploration or field development.

Ease of Use & True Mobility: Leverage the latest in technology to minimize your learning curve and focus on what's important. No more digging through tons of menus and dialogs to find what you are looking for. The multi-screen enabled, ribbon-based interface puts everything you need right in front of you. GVERSE Geophysics supports remote, desktop and mobile environments to accommodate some of the industry's largest regional projects while reducing need for IT support.

Installing GVERSE Geophysics

GVERSE Geophysics along with its 3D module, is installed seamlessly as part of the GeoGraphix installation. For system prerequisites and installation instructions, refer to the GeoGraphix Installation Guide on the LMKR Support Portal > Knowledge Center > Release Notes and Installation Guides page.

What's New in GVERSE Geophysics 2019.3

Create End-to-End Synthetic Seismograms

Create and edit synthetic seismograms in a sleek new interface.

Work with deviated wells.

Extract wavelets from 2D & 3D seismic data.

Create averaged wavelets by combining multiple wavelets.

View and compare seismic power spectrum with wavelets.

Save wavelets at project level and access across interpretations.

Apply processing to input logs.

Estimate sonic from density and vice versa.

Calibrate sonic log with checkshots and other T-D tables.

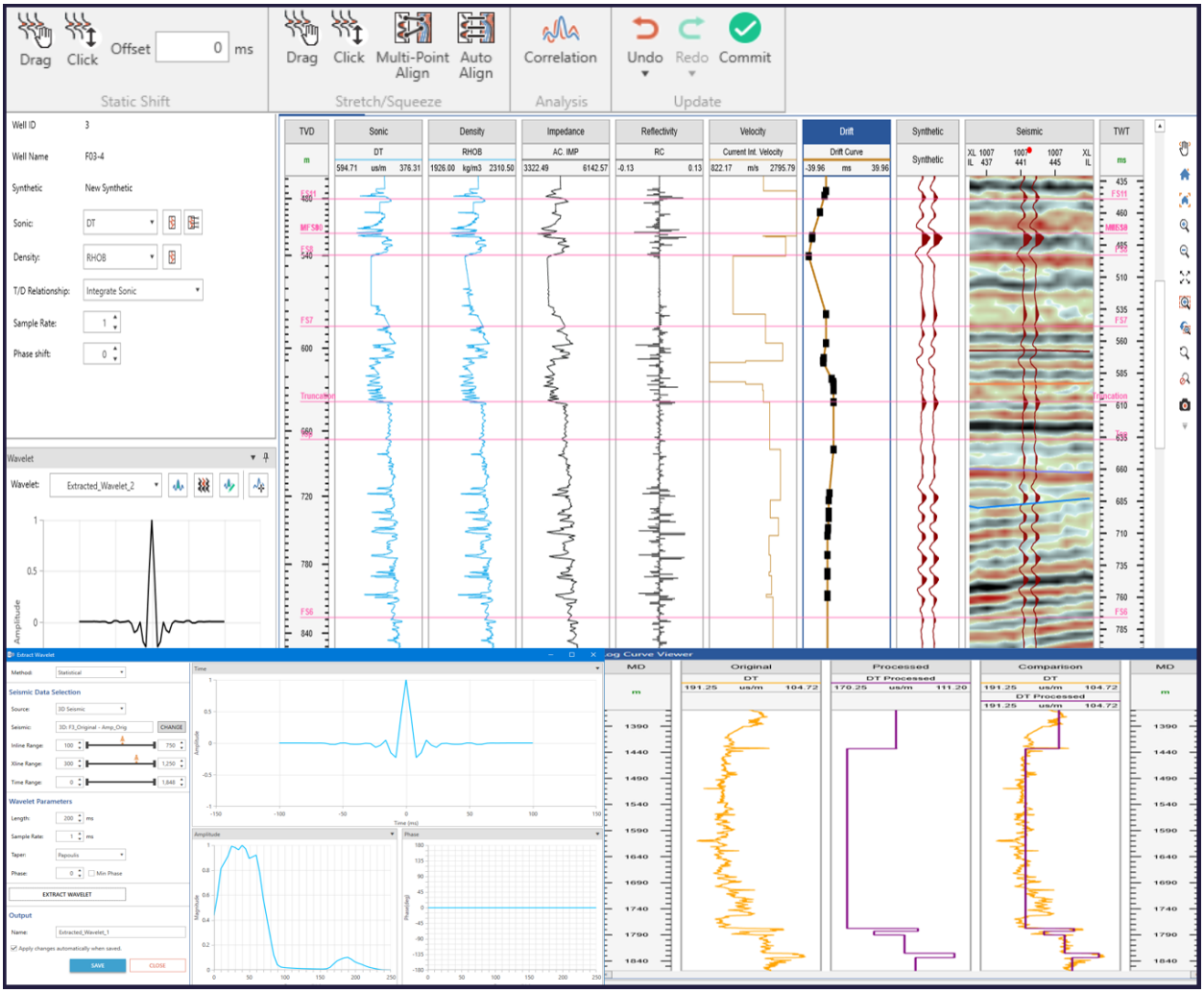
Edit synthetic with multi-point stretch squeeze and auto-align functions.

Save complete edit history in database to undo/redo edits anytime.

QC edits with interval velocity and drift curve plots.

Add custom track to view any available well log.

Restore wavelets or input logs if removed from database.



Do More with Geobodies

Map geobody surfaces and thickness.

Create IsoMap layers from geobodies.

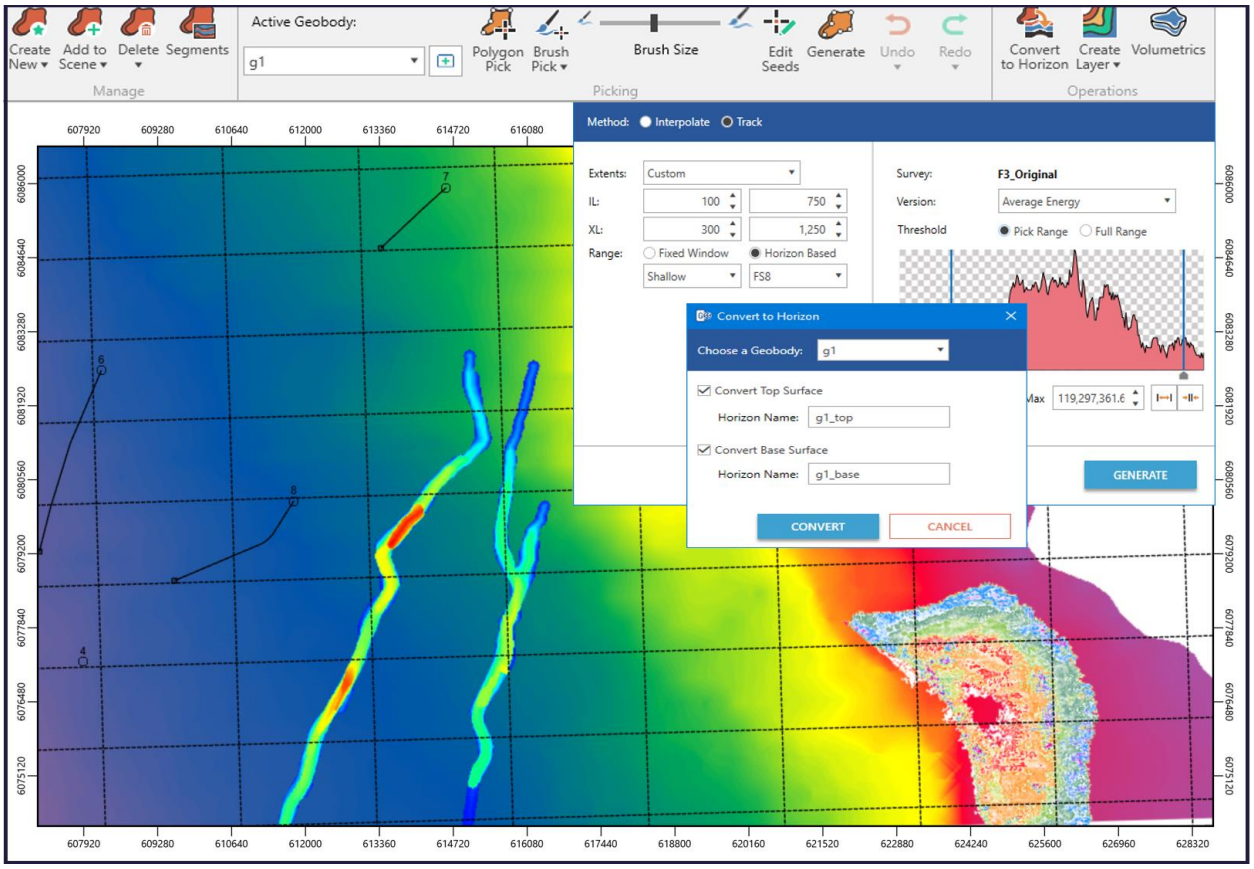
Convert a geobody surface into a horizon.

Compute attributes on geobodies.

View depth converted geobodies in Virtual Depth mode.

Limit geobody tracking between two horizons.

Edit geobody seed picks.



Detect Faults Automatically

Auto-pick segments or surfaces with a single click.

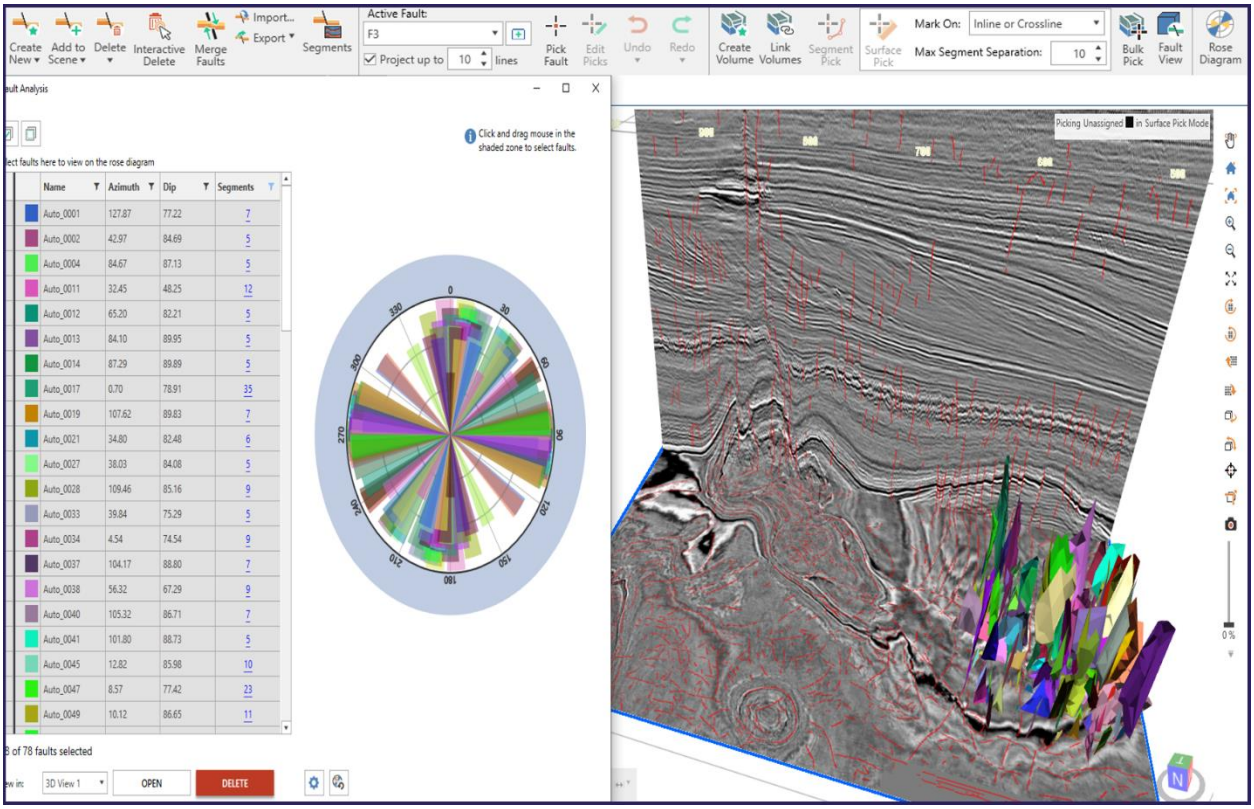
Create fault surfaces in bulk for all faults detected in a seismic volume.

Use Rose diagram for rapid fault analysis.

Project faults on unpicked sections to assist manual picking.

Adjust picks with advanced editing and batch actions.

Save each fault as a separate file in bulk exports.



Crossplot Volumes and Attributes

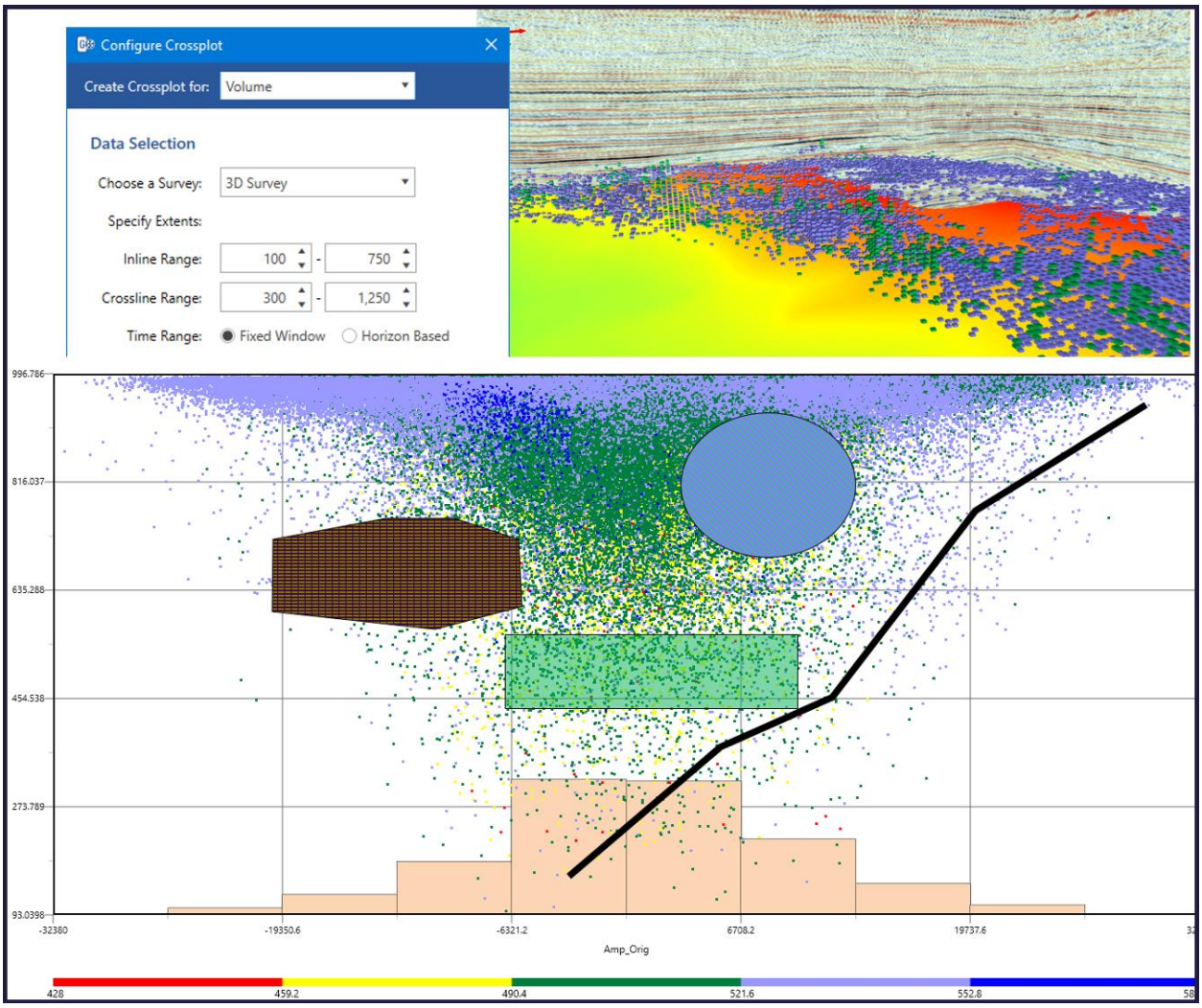
Create scatter plots for seismic volumes, attribute surfaces and well data.

Plot at seismic sections, horizons, well locations or a volume.

Highlight interesting data with a complete annotation toolset.

View anomalies on maps or 3D.

Save and share crossplots.

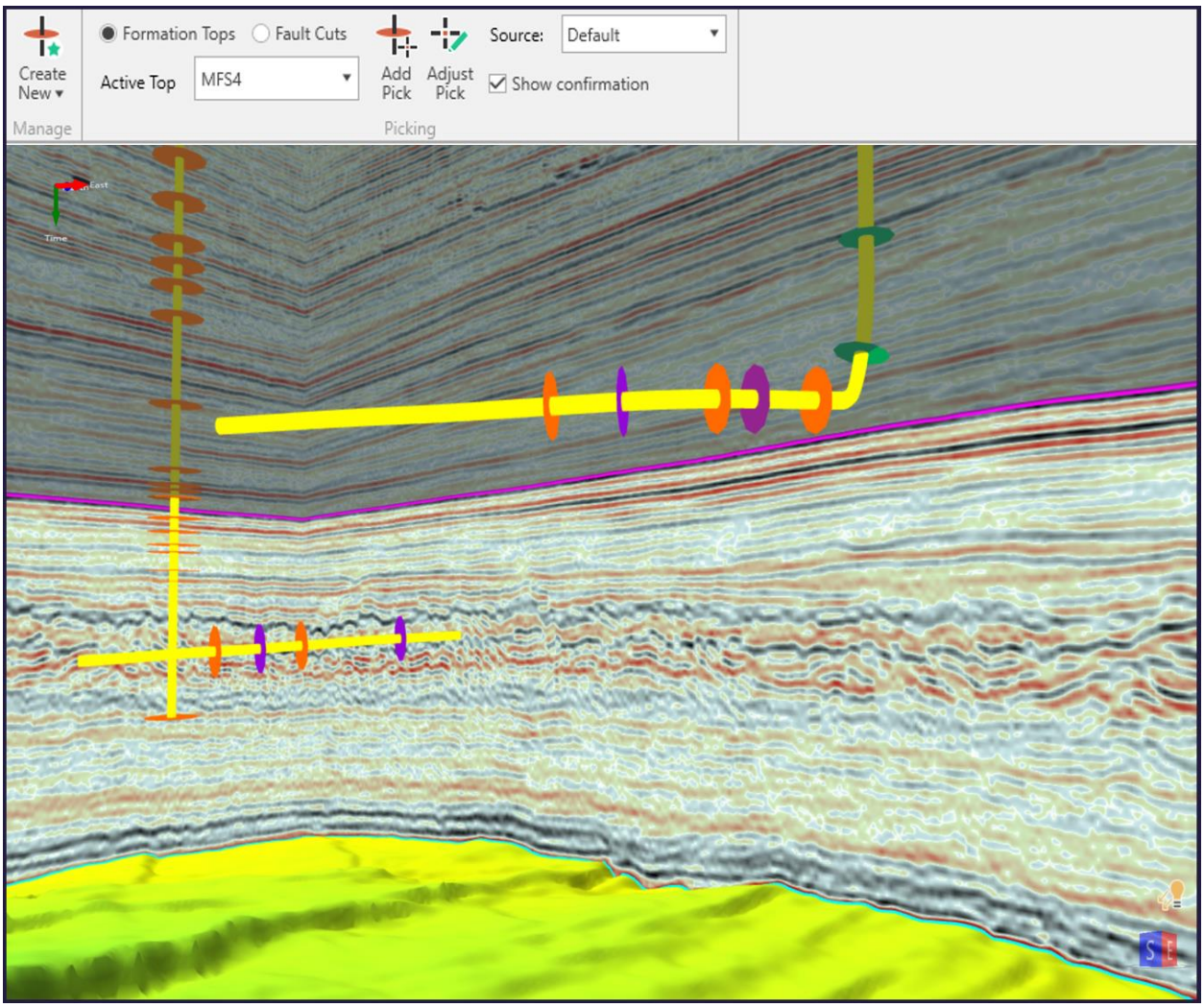


Pick and Edit Well Tops

Add new picks for formations and faults in a well.

Adjust existing picks for formations and faults.

View and interact with multiple observations in a well.

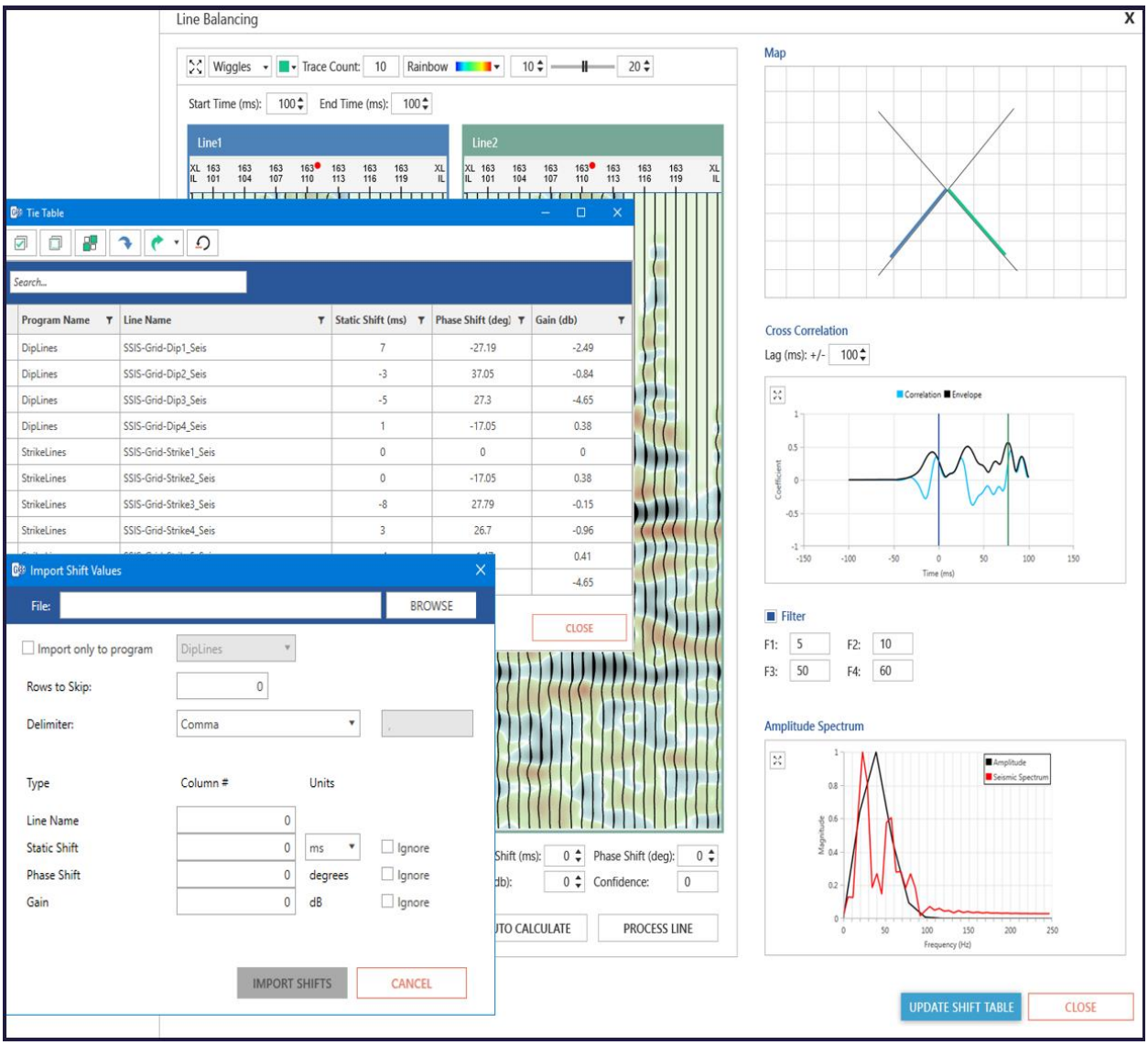


Balance 2D Lines with Ease

Add, edit and search shifts for all 2D lines in one location.

Import and export shift values.

Use a revamped line balancing tool to quickly match lines and auto calculate shifts.

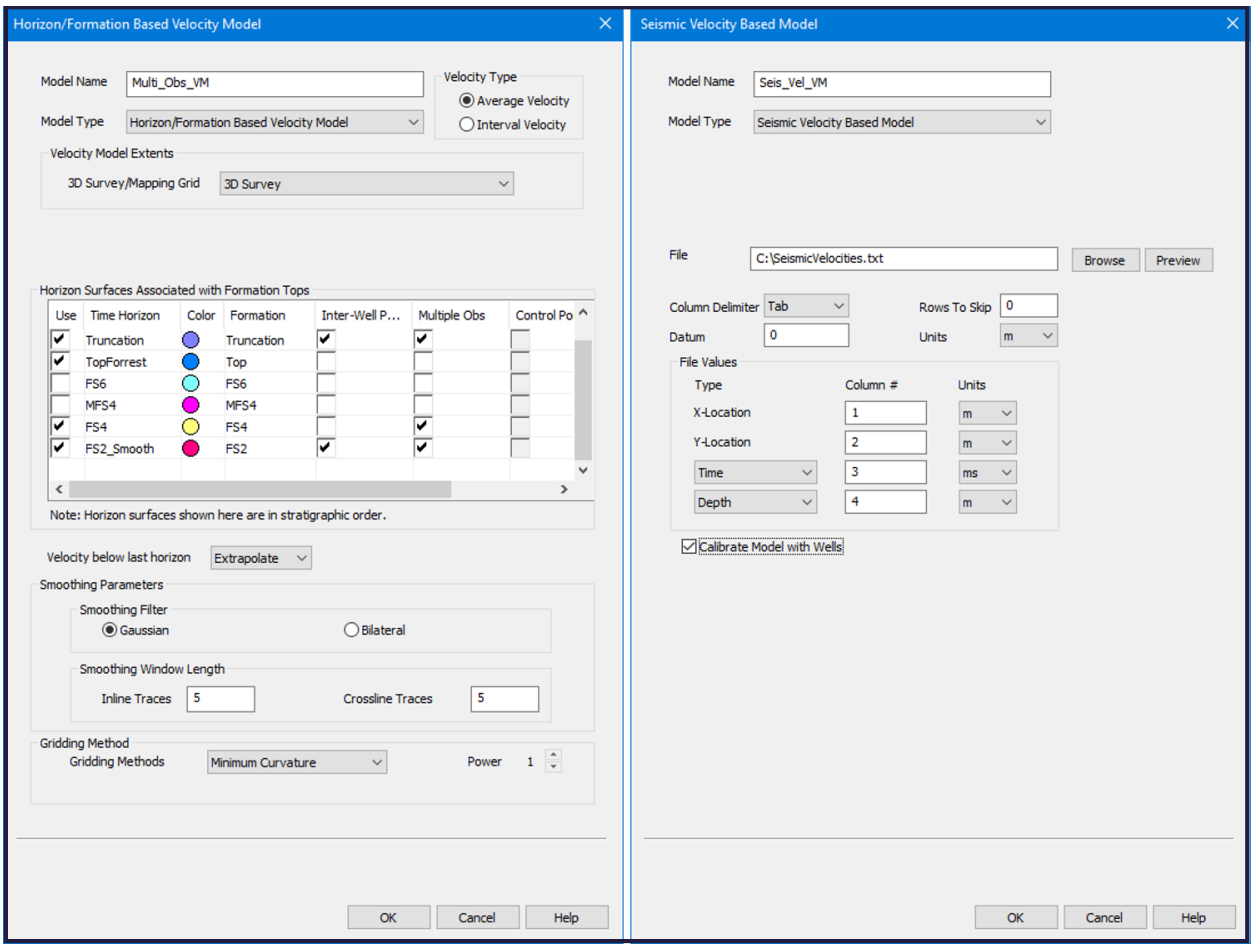


Build Better Velocity Models

Create efficient velocity models from seismic velocity data.

Incorporate multiple observations for accurate gridding.

Build more reliable models with improvements in triangulation algorithm.



Use AI for Facies Classification

Classify facies on horizons using AI and neural networks with automatic waveform classification by a self-organizing maps algorithm.

Visualize even more in 3D

Display microseismic data in 3D scene.

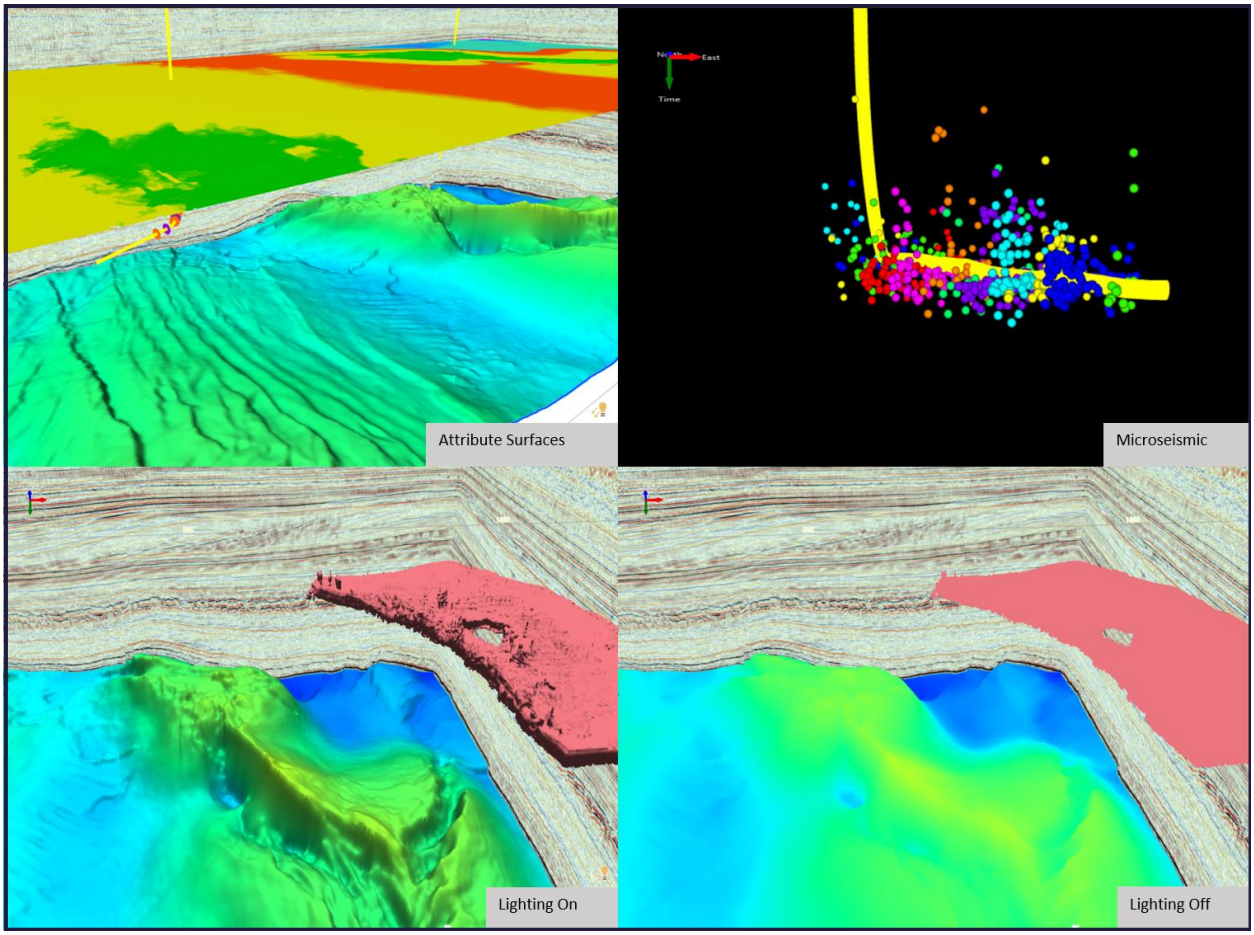
Observe crossplot points in 3D.

Display newly generated attribute surfaces.

Display multiple observations for formations and faults.

Sync vertical and horizontal seismic windows with 3D displays.

An innovative lighting interface.



Improve Efficiency

Improved default color palette controls, including seismic data versions.

Minimize mis-clicks with color-coded action labels on all warning messages.

A redesigned navigation bar.

Read start times directly from traces headers when loading 2D seismic lines.

Sort formation annotation list by name or associated horizon.

Control vertical exaggeration by ratio on seismic displays.

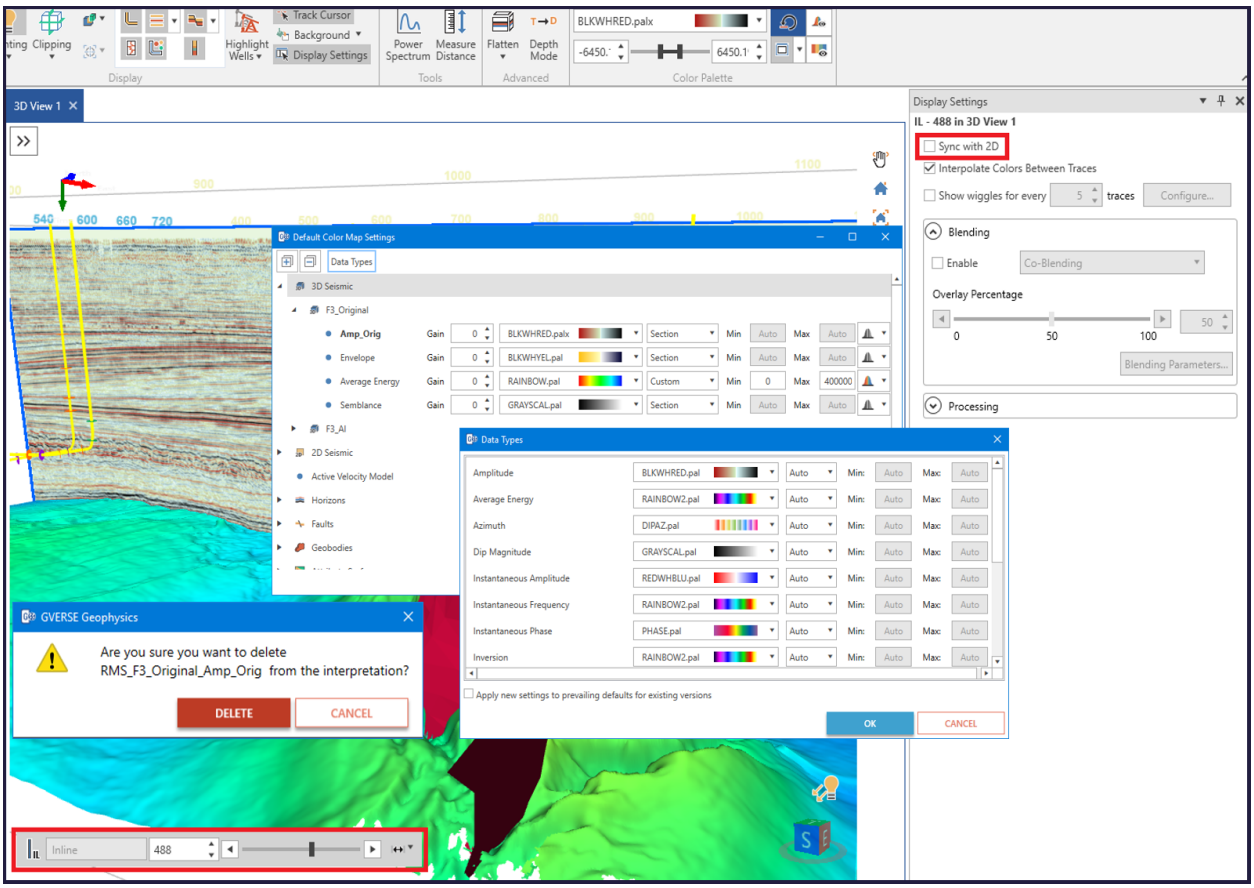
Control well display by UWI or name.

Follow well bore when creating well-to-well arblines.

Take pictures of power spectra for your presentations.

Select multiple 2D lines to export directly from map.

Find faults for reassigning to faster with a redesigned menu.



Fixed Issues

ID	Description
196422	In certain scenarios, erratic display was observed on vertical sections when horizons were flattened. This issue has been fixed.
196640	Performance degradation was observed in a client's environment for network projects containing multiple AOIs when launching the 3D scene or switching between the tabs. This issue has been resolved by fetching the AOI data on demand. The fetched data (list of AOIs) is then stored locally in cache ensuring fast data retrieval for subsequent operations. Any change in AOI from other applications requires the users to manually refresh the AOI list in 3D module of GVERSE Geophysics.
208812	In certain datasets, auto calculating the misties from the Interactive Line Tie Analysis window resulted in the application to crash. This issue has been fixed.
209978	Changing the horizon usage in Horizon Manager caused the application to crash using certain datasets. This issue has been fixed.

Known Issues

ID	Description
199116	**GVERSE Geophysics 3D Module** – Geobody generation using full extents caused the application to crash in a 32-bit environment. **Workaround:** Generate the geobody in a 64-bit environment. However, if you must generate the geobody in a 32-bit environment, limit the extents to a smaller region to avoid the application crash.
197262	**GVERSE Geophysics Main Interface** – Drawing a composite lines sometimes results in the line intersecting itself primarily because the closest trace for each line at the intersection lies on the other side of the intersection.

Third Party Applications

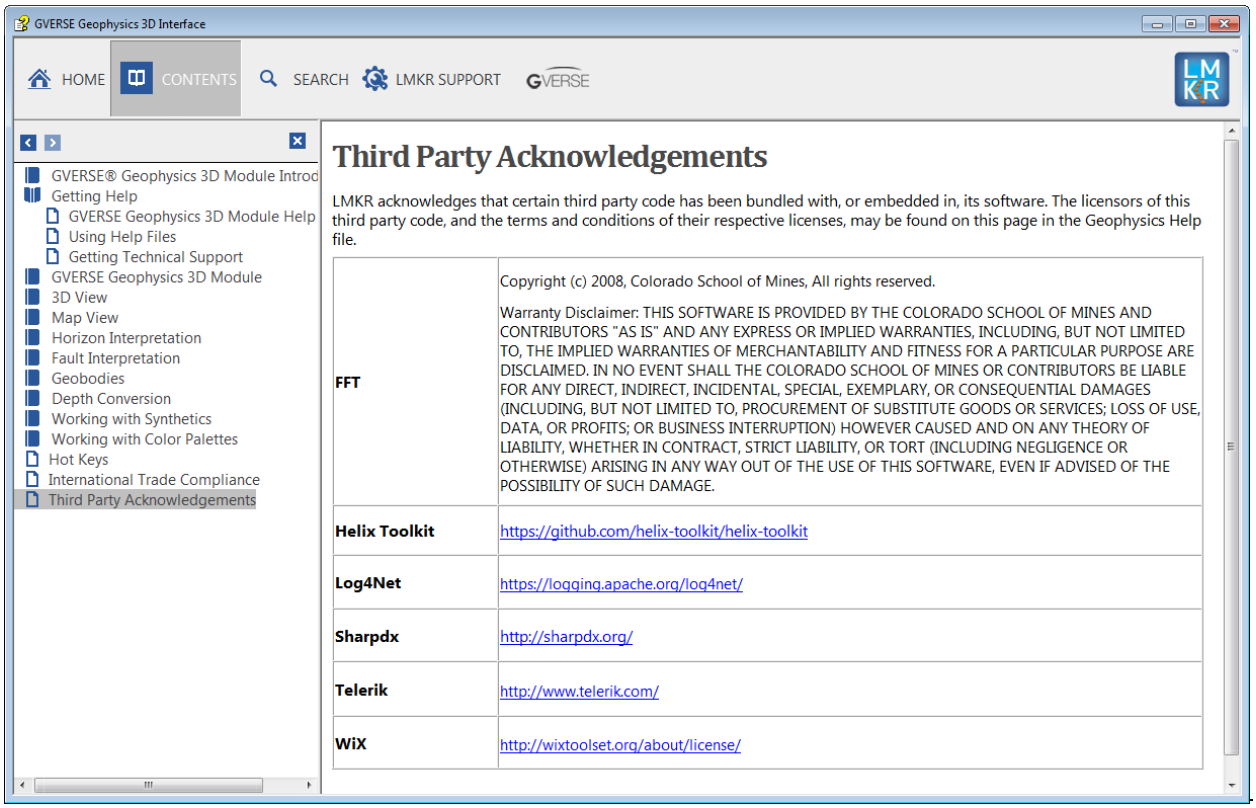
LMKR acknowledges that certain third party code has been bundled with, or embedded in, its software. The licensors of this third party code, and the terms and conditions of their respective licenses, may be found in the Geophysics help file.

To access the 3rd party license agreements:

1. Either press **<F1>** or click the **Help** button located at the top right corner**.**

   The Help window displays.

2. In the **Contents** pane, locate the **Third Party Acknowledgements** help topic as shown in the image below.



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The ECCNs provided here (if available) represent LMKR's opinion of the correct classification for the product today (based on the original software and/or original hardware). Classifications are subject to change. If you have any questions or need assistance please contact us at support@lmkr.com.

Under the U.S. Export Administration Regulations (EAR), the U.S. Government assigns your organization or client, as exporter/importer of record, responsibility for determining the correct authorization for the item at the time of export/import. Restrictions may apply to shipments based on the products, the customer, or the country of destination, and an export license may be required by the Department of Commerce prior to shipment. The U.S. Bureau of Industry and Security provides a website to assist you with determining the need for a license and with information regarding where to obtain help.

The URL is: http://www.bis.doc.gov.

Definitions

ECCN - Export Control Classification Number - The ECCN is an alpha-numeric code, e.g., 3A001, that describes a particular item or type of item, and shows the controls placed on that item. The CCL (Commerce Control List) is divided into ten broad categories, and each category is further subdivided into five product groups. The CCL is available on the EAR Website.

EAR - Export Administration Regulation - The EAR is a set of regulations that are administered by the Bureau of Industry and Security, which is part of the US Commerce Department. In general, the EAR govern whether a person may export a thing from the U.S., re-export the thing from a foreign country, or transfer a thing from one person to another in a foreign country. The EAR apply to physical things (sometimes referred to as "commodities") as well as technology and software.

The EAR number and the License type for this product are included in the table below. Also included is the date the table was last updated.

Product/Component/R5000	EAR Number	License	Last Updated On
GVERSE Geophysics	EAR99	EAR	03/28/2018

Contacting LMKR Support

LMKR is committed to providing the highest level of technical customer support in the industry. With an average tenure of more than thirteen years, our highly trained and experienced staff of technical analysts is comprised of geoscientists, engineers, land professionals, petrophysicists, and system specialists.

Please refer to our Customer Support timings mentioned below to ensure that you have access to our support analysts assigned to your region. When getting in touch with LMKR support, please remember that real-time support will not be available during bank holidays or after office hours. If you do get in touch with LMKR Support outside of work hours, please leave a voice message with a brief description of the issue that you are facing. Your voice message will be used to automatically create a support case for you. This will enable our analysts to attend to your issue and provide you with a resolution as soon as possible

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Monday – Friday 8 am – 6 pm CST* Toll Free (US/Canada) : +1 855 GGX LMKR (449 5657) **Colombia:** +57 1381 4908 **United States:** +1 303 295 0020 **Canada:** +1 587 233 4004 **Excluding bank holidays*	**UK:** Monday – Friday 8 am – 5 pm* +44 20 3608 8042 **UAE:** Sunday – Thursday (Dubai GMT+4) 8 am – 5 pm* +971 4 3727 999 **Excluding bank holidays*
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Helpful Links

Name	Website Address
LMKR Homepage	http://www.lmkr.com
LMKR GVERSE	http://www.lmkr.com/gverse
LMKR Support Portal	http://support.lmkr.com